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ABSTRACT

In order to study the characteristics of learning disabled (LD) college students and the coping strategies developed to deal with college demands, 57 LD students--enrolled at a selective university that offered no special program for LD students--were identified through questionnaires, self referral, and teacher referral. Analysis of a variety of tests and structured interviews revealed that the LD Ss performed differently from nondisabled Ss on 9 of 14 variables in the psychoeducational assessments. Ss also had lower overall IQs with wider scatter. LD Ss reported experiencing more difficulties and receiving more help in both elementary and high school; using more university resources; needing more time to perform well; experiencing more problems with memorization, drawing, and copying; and dropping or avoiding difficult subjects as a way of coping with their problems. (CL)

An Exploratory Study of Learning Disabilities in College Students

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Running Head: College LD

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An Exploratory Study of Learning Disabilities in College Students

The college student with learning disabilities poses a unique challenge to higher education. Unlike more visible populations of exceptional students, such as the blind or the orthopedically handicapped, college students with learning disabilities are not easily differentiated from their nonhandicapped peers and often do not receive the attention and aid their problems mandate (Ansara, 1971; Marsh, Gearheart & Gearheart, 1978; Vogel, 1982). College students with learning difficulties caused by underlying deficits are success stories, because in spite of learning problems, they have graduated high school and have been admitted to college. Kronick (1970) states that flexible approaches to learning disabilities will become increasingly common in our colleges as understanding of this disability becomes more widespread.

Interest in college students with learning disabilities is increasing. The Association for Children with Learning Disabilities (ACLD) recently voted to change its name to the Association for Children and Adults with Learning Disabilities in recognition that problems of learning disabilities do not magically disappear with childhood. ACLD also instituted a postsecondary strand devoted to issues of learning disabilities at that level.

Cordoni (1982) describes the current situation faced by learning disabled students who wish to attend college. "So few college programs exist that those that offer even minimal support are filled many months before the semester begins" (p. 265). The paucity of special programs, projects, and services designed for LD college students indicates that most LD college students attend colleges without formal programs designed for them. In the current special education vernacular, these college students with learning disabilities are mainstreamed. But, unlike younger students with learning disabilities, who are pro-

tected by federal and state legislation and receive services mandated in their individualized educational plans, college students with learning disabilities are on their own and may not be visible on campus. They form a hidden population.

Chalfant and Scheffelin (1969) recommend precise descriptions of behaviors related to dysfunctions in learning. Goodman, Mann and Wiederholt (1978) call for determination of relevant psychoeducational characteristics of learning disabled secondary students. The preliminary and tentative state of knowledge about college students with learning disabilities points to an exploratory field study as a research method.

Questions emerging from the learning disabilities field were explored. A large number of variables relevant to understanding college students with learning disabilities were studied.

Because systematic study of college students with learning disabilities who attend schools without special programs for them has not been undertaken and exploration of coping strategies used by those students is lacking, the research had two purposes. The first goal was the identification of the nature and determinants of learning disabilities for students at a selective university without a special program for students with learning disabilities. Secondly, the research identified successful coping strategies developed by college students with learning disabilities.

Methods

Sample

The field of learning disabilities is plagued with difficulties around the areas of definition of learning disabilities and identification of students as learning disabled (Hallahan & Cruickshank, 1973; Kirk & Gallagher, 1979; Mann,

Goodman & Wiederholt, 1978). The proper definition of learning disabilities for school-age children is in dispute. There is little agreement among professionals upon operational criteria for identifying children with learning disabilities (Hobbs, 1975; Mann, Goodman & Wiederholt, 1978).

The most widely used definition of learning disabilities is the one offered by the U.S. Office of Education and is used in the Education for All Handicapped Children Act, PL 94-142. This definition of learning disabilities and those proposed by Bateman (1964), Lerner (1971), and de Hirsch, Jansky & Langford (1966), have been criticized as being too vague.

In a review of the various definitions given for specific learning disabilities, Kirk & Gallagher (1979) give three criteria for learning disabilities: (1) a discrepancy between abilities or between potential and achievement, (2) an exclusion factor, and (3) a special education criterion. The Kirk & Gallagher defintion was used as a guideline for the research. A differentiated sample selection process was initiated. The study attempted to tap college students who had previously been diagnosed as learning disabled as well as those who exhibited indicators of possible learning disabilities.

Subjects came from several sources. Publicity throughout the University about the study yielded 11 students, who referred themselves as subjects. Faculty members referred 17 students.

Questionnaire. To tap the population of college students who perform on psychoeducational measures as learning disabled and who had characteristics associated with learning disabilities but who may not have experienced unusual difficulties with college work and who were not diagnosed as having difficulties, the author designed a brief questionnaire and administered it to 314 students by visiting a variety of large undergraduate classes. The questionnaire appears in Appendix A. The questionnaire tested auditory sequencing and visual motor

integration abilities and provided information about past and current learning. Students who took the questionnaire were solicited for participation in the research if they (1) had been previously diagnosed as learning disabled, (2) missed both digit or both drawing items, or (3) scored in the lowest 10 percent of the population tested.

Students who had the fewest indicators of learning problems and who missed no digit or drawing items were solicited for the control group. The composition of the study population by sources appears in Table 1. The study population had 57 learning disabled and 24 control subjects. Twenty-five students had been previously diagnosed as learning disabled and 31 students exhibited indicators of learning disabilities. There were 32 male and 25 female students in the LD group and 14 male and 10 female students in the control group.

Insert Table 1 about here

Categorization of the Sample

The sample was categorized into three subgroups according to possession of a learning disability or indicators of learning disabilities and grade point average.

The range of participants' grade point averages was 1.63 to 3.67 (A equals 4 points, B equals 3 points, etc.), with the mean grade point average being 2.86. Therefore, the three sub-groups were:

Group 1: College students with learning disabilities and indicators of learning disabilities who have good academic performance in college. N = 28 GPA = 2.87 to 3.67

Group 2: College students with learning disabilities and indicators of learning disabilities who N = 29 GPA = 1.63 to 2.85

have poor academic performance in college.

Group 3: College students with no indicators of learning disabilities. N = 24
GPA = 1.91 to 3.60

Data Collection Instruments

The main questions and the instruments addressing each question are given.

Question 1: How do college students with learning disabilities perform on psychoeducational assessments?

It was expected that college students with learning disabilities would show poorer performance on most of the psychoeducational assessments than control subjects. However, some areas of strength could conceivably be higher in the LD group than in the control group. The study explored many different areas of psychoeducational functioning to actually determine which differences exist between these two groups. In addition to differences between learning disabled and nondisabled students, the research explored possible differences between those students with learning disabilities and indicators of learning disabilities who had good academic performance in college and those with poor academic performance in college. Based upon preliminary work and literature review, the researcher hypothesized that differences between LD students with good and poor academic performance were due to factors other than psychoeducational ones, and that no differences between these two groups would emerge on variables assessing psychoeducational performance.

Bannatyne (1971) cites the Wechsler Intelligence Scale for Children (Wechsler, 1974) as an essential part of any diagnostic battery for testing children suspected of having learning disabilities. Thurlow and Ysseldyke (1979), in a nationwide survey of model Child Service Demonstration Centers (CSDC) developing programs for learning disabled children reported that the WISC/WISC-R was utilized by the highest percentage of CSDCs.

Sample subgroups were first compared on Overall IQ, Verbal IQ and Performance IQ, to see if any differences emerged.

Overall scatter was then examined by computing the difference between the highest and lowest subtest scale scores. Qualitative information from the WAIS-R was used to determine strengths, weaknesses, and coping strategies.

Despite the cautions against using profile scatter diagnostically, a number of researchers and theorists in the LD field have attempted to analyze learning disabled students according to scatter analysis of the Wechsler scales. Bannatyne has proposed a recategorization of the WISC for purposes of identifying groups of learning disabled children. He groups the subtests into four areas: Spatial Ability, Sequencing Ability, Verbal Conceptualization and Acquired Knowledge.

Bannatyne suggests summing the scale scores in each ability area to determine the average scaled score in each area. Then, analysis of the subject's average scores in each of the four areas may show patterns of differences between areas.

Dykman and Ackerman (1976) describe an ACID score, consisting of low scores on the Arithmetic, Coding, Information and Digit Span subtests of the WISC, as characteristic of learning disabled students in the elementary grades. This low ACID pattern persists into adolescence.

The Bannatyne recategorization of the Wechsler Scales and usefulness of the ACID score has not been researched with college students with learning disabilities. Bannatyne's approach and the ACID factor, which have been useful in diagnosing children with learning disabilities, were tested with the present population.

Perceptual and motor deficits of LD adolescents tend to improve with age, but college students with learning disabilities may still exhibit deficits in

this area. The Bender Visual Motor Gestalt Test (Bender, 1938) was used to assess perceptual-motor development. The Bender is one of the ten most commonly used tests in learning disabilities batteries (Coles, 1978). The Bender score in this study is the number of designs failed.

Students with visual-perceptual difficulties may learn to compensate for perceptual impairment. Koppitz (1963) cites different types of behavior observed in brain injured children trying to compensate for difficulties in visual-motor perception. When students used unusual methods of copying and completing the designs (tracing with fingers, refusal to look at drawings while copying them, etc.), these were noted, viewed as possible coping mechanisms, and related to the other findings.

The Test of Adolescent Language (Hammill, Brown, Larsen & Wiederholt, 1980) is used to assess several areas of language functioning. Assessments used with children with learning disabilities, for example, the Illinois Test of Psycholinguistic Ability, (Kirk, McCarthy, & Kirk, 1968) are inappropriate for use with adolescents. However, verbal and nonverbal communication deficits may continue in adolescence. "The assumption that the learning disabled child will outgrow his deficits and be normal as an adolescent and young adult is proving erroneous" (Wiig and Semel, 1980, p. 21).

The TOAL is intended to assess language functioning of students in grades 6-12. It was used with college students due to the lack of equivalent or better instruments designed for the college-level student.

The Wide Range Achievement Test (Jastak & Jastak, 1978) was used as a measure of achievement in spelling and mathematics. The WRAT is one of the five most used assessment devices for learning disabilities used by Child Service Demonstration Centers (Thurlow & Ysseldyke, 1979).

Reading is the primary area affected by learning disabilities in young

children. It therefore becomes important to learn the nature of reading disabilities or deficits in LD college students. The Gates-MacGinitie Reading Tests (Gates & MacGinitie, 1978) were used to assess reading ability of college students with learning disabilities.

Question 2: What was the past background of college students with learning disabilities?

Question 3: What is the college experience like for college students with learning disabilities?

Question 4: What coping strategies did college students with learning disabilities develop to deal with past schooling?

Question 5. What are the coping strategies college students with learning disabilities use to deal with college work?

Past academic background and the college experience were explored using an individually administered interview, and ratings of papers and exams. Each instrument is described.

To provide the opportunity for college students with learning disabilities and indicators of learning disabilities to give their personal perspectives an individually administered interview, designed for the study, was used.

The interview explored past background and current functioning in college. It addressed areas in which learning was problematic and coping strategies used to overcome learning problems. The areas probed in the interview were:

1) personal and physical data.

2) learning before college entrance.

3) current functioning in college.

The sections covering personal and physical data included identification of handedness, possible mixed dominance, questions about wearing of vision or hearing aids, general physical problems, and past diagnosis of learning disabili-

ties.

The section concerning past academic history had two parts, elementary learning, and high school learning. The section about college included questions about ease of learning, use of assistance, and questions about specific subjects and tasks.

Each participant was asked to give the researcher an in-class essay exam and a paper done for a college course. Students were asked to pick a typical example of each, not necessarily their best or worst work. The exam was rated on the following factors: neatness, grammar, ideas, and overall spelling ability. The paper was rated on overall organization, neatness, grammar, ideas, and overall spelling ability. These materials were collected to obtain a sample of actual college work, an additional perspective to performance on standardized tests. In addition, information from the psychoeducational assessments was used to describe coping strategies used by college students with learning disabilities.

Data Collection Procedures

Three trained psychoeducational diagnosticians administered the interview, Bender Gestalt and the WAIS-R. A form was developed for recording the qualitative aspects of the psychoeducational assessments. The diagnosticians did not know if subjects were members of the study or control groups.

Two undergraduate research aides were trained in test administration. The two research aides were responsibile for scheduling, administering, and scoring of the TOAL, WRAT, and Gates-MacGinitie tests.

Data collection took place from November, 1982 through May, 1983.

Results

Q. 1. How do college students with learning disabilities perform on psychoeducational assessments?

Analyses of variance were used to compare the entire population of learning disabled students with the entire population of control subjects on the variables of the psychoeducational assessments.

The variables which were tested and their significance appear in Table 2.

Insert Table 2 about here

These results indicate that college students with learning disabilities and indicators of learning disabilities do perform differently on most psychoeducational assessments than college students without learning disabilities. The learning disabled subjects differed from the nondisabled subjects on nine of 14 variables culled from the psychoeducational assessments. It must be noted however, that the 14 variables are not all independent of each other. The variables from the WAIS-R are grouped to generate the five WAIS-R factor scores.

Learning disabled subjects had lower Overall IQ's than controls, and also showed wider scatter than controls. Learning disabled subjects also showed a trend of having lowered Verbal and Performance IQs. In addition, significant differences in two of Bannatyne's recategorization factors, Sequencing Ability (comprising Digit Span, Arithmetic and Coding) and Acquired Knowledge (Information, Arithmetic, Vocabulary) may indicate that combined factor scores yield more useful information in viewing LD college students. The lowered Sequencing Ability Factor scores for the LD subjects point to problems in sequencing tasks for college students with LD. The Acquired Knowledge score, composed of Information, Arithmetic, and Vocabulary scores, is significantly lower for the LD

group when compared to controls while these three subtest scores viewed separately were not significantly different for the two groups. The lowered Acquired Knowledge score suggests that LD students do not pick up information as automatically from their environments or do not retain such information as clearly as controls. The WAIS-R ACID Score, the combined scores of the Arithmetic, Digit Symbol, Information and Digit Span subtests is also significantly lower for the LD group, another indication of how LD college students are similar to younger students with learning disabilities.

That learning disabled students at Clark University are not significantly different from controls in the Verbal Conceptualization Ability and Spatial Ability factors may in fact point to the LD students' strengths in verbal reasoning and abstract spatial reasoning and shed light on the nature of their coping abilities.

Analysis of variance was used to compare the results of the psychoeducational assessments for the good academic performance LD group compared to the poor academic performance LD group. The variables and significance levels for this analysis appear in Table 3.

Insert Table 3 about here

Only two differences in the psychoeducational assessments were found to be significant at the .05 level when the good academic performance and poor academic performance subjects were compared, one difference on the Gates-MacGinitie Reading Tests and one on the ACID Factor of the WAIS-R. Caution concerning certain statistical differences occurring by chance is germaine to these findings of only two differences occurring from 14 ANOVAs. Therefore, at first examination it would seem that LD college students with good academic perform-

ance are essentially the same psychoeducationally as LD college students with poor academic performance. However, although other variables were not significantly different when good and poor academic performance LD subjects were compared on the psychoeducational assessments, one pattern does emerge. The good academic performance LD subjects have higher numerical scores on 11 of 14 variables, two which are statistically different. While the other scores are not statistically different, they do indicate a pattern of good academic performance LD subjects having higher scores on psychoeducational assessments than poor academic performance LD subjects.

Q. 2. What was the past background of college students with learning disabilities?

The sample subgroups were compared to each other on past academic background and physical characteristics using chi-square analysis. Learning disabled subjects reported experiencing more academic areas hard and reported receiving more help in both elementary and high school than control subjects. A trend occurred of more learning disabled students in the sample wearing glasses, and reporting mixed dominance than controls, signs associated with younger children with learning disabilities.

When the two subgroups of learning disabled students were compared to each other, there were no significant differences observed in this area. The chi-square analyses for variables from the interview data appear in Appendix B.

Q. 3. What is the college experience like for college students with learning disabilities?

Chi-square analysis was used to explore the various academic tasks in college. More LD students reported difficulty with academic subjects than con-

trols. However, there is no difference in overall help received in college by LD and control subjects. This may occur because the specialized help does not exist in the college setting. Secondly, more control subjects report seeking help in college than in past schooling, so differences between LD control subjects found in help in earlier schooling are not as great as earlier.

On ratings of actual college papers and exams, (see Table 4) more LD students received low ratings than controls in 4 of 9 categories. The LD subjects received lower ratings than controls on neatness, ideas and spelling on exams, and grammar on papers. More learning disabled students perform worse in the in-class exam situation than on papers. Therefore, the method of expression required for college work seems to be an important factor in academic achievement for learning disabled students.

Insert Table 4 about here

When the learning disabled students were compared to each other by subgroups, fewer good academic performance LD subjects reported experiencing difficulty with papers than poor academic performance LD subjects. The good and poor academic performance LD subjects did not differ on exam ratings, but did show differences in grammar and spelling on papers (see Table 5). Therefore, differences in college functioning of good and poor academic performance LD subjects did emerge in the paper situation. Learning disabled students with good academic performance seem to utilize the extra time allowed in the paper situation to use compensatory strategies.

Q. 4. What coping strategies did college students with learning disabilities develop to deal with past schooling?

There were no differences between LD and control subjects on methods of

learning reported in past learning. However, significantly more LD subjects than controls reported difficulty with written expression in past learning. Help by school personnel, private tutoring and family help in elementary school were reported by more LD than control subjects. In high school more LD students than controls reported help by school personnel. No significant differences were found in methods of learning and methods of expression in past learning when good and poor academic performance LD subjects were compared. The two groups also showed no differences in kinds of help received in the elementary and high school years.

Q. 5. What are the coping strategies college students with learning disabilities use to deal with college work?

The only difference between LD and control subjects in reported help received in college was in the area of use of university resources. The LD students utilized the university resources more than controls. No differences occurred in comparisons of good and poor academic performance LD subjects on the total reported kinds of help received in college.

Qualitative Data Pertaining to Coping Strategies

The qualitative data about past and present learning provided added information about problem areas and coping strategies for college students with learning disabilities.

When the learning disabled and control students were compared on problem areas and coping strategies discussed in the interviews, several themes emerged. The area of reading time was mentioned more frequently by LD than control subjects.

Needing more time and time pressures in general were discussed by many LD students, and only a few control subjects. Extra time was both a stressor and a

useful coping strategy for LD students. Learning disabled students were acutely aware of needing extra time to perform well. That learning disabled students received better ratings in the papers than the exams analyzed in the research partially confirms the role of extra time enabling LD students to achieve well in college.

Many LD students discussed memorization; a few cited strengths in memorization as a coping strategy, while more LD students experienced problems with memorization. Memorization was not discussed by any control subjects.

Problems with grammar and details were also cited by a large number of LD subjects. Coping strategies used to deal with these problems included looking everything up in reference sources, using conceptual skills to solve problems of missing details, and putting details into meaningful contexts.

Problems with drawing and copying continue in college for the LD students. Also, trouble with extemporaneous speaking and word finding problems are discussed by some LD students. Several LD students reported constructing new sentences in speaking or writing when they can't find a proper word to express their ideas.

Organization was cited by many LD subjects. A few LD subjects use good organizational abilities to help them, while others have problems with organization.

Dropping subjects that are too hard or avoiding difficult subjects were used as coping strategies by LD subjects. Several control subjects also make use of the freedom of the college setting to avoid difficut subjects.

Several LD students describe spending extra effort to meet academic requirements. They know they have to work harder than students without learning disabilities and they do put in the required effort.

Process Analysis of Psychoeducational Assessments

The process analysis of the psychoeducational assessments showed more areas of immature behavior for LD than control subjects. When LD and control subjects were compared on the various subtests. The LD students had both verbal and pictoral reversals, directional difficulties, sequencing problems, and poor quality of reproduced designs. Learning disabled students exhibited memory difficulties. Various problems with language, including expressive difficulties, substitution, word-retrieval problems and talking around a point were exhibited by LD students. Using excess verbiage and motor behaviors, such as handling stimulus cards, pointing, and finger-tracing, seem to help some LD students finally create a correct response. It is hypothesized that LD students use behaviors at lower developmental levels to enable them to handle conceptual tasks.

When the good and poor academic performance LD groups were compared, few differences emerge. More reversals, more concrete responses, and more repetitions are characteristic of the poor academic performance LD group.

Discussion

The two major areas of concern in this exploratory study of college students with learning disabilities at a selective four-year university were characteristics of LD college students, and coping strategies developed to deal with college demands. The study was exploratory in both nature and methodology. This particular population of learning disabled students has not been systematically studied. The methodology provided for a variety of psychoeducational data coupled with qualitative information from interviews and examination of work products.

A major strength of the study, its broad-based approach, may also have led to certain limitations. Because of the lack of prior studies about this popula-

lation, the researcher chose not to limit the study to one particular area, such as language functioning or patterns on intelligence tests. Instead, in trying to obtain an overview of the population without closing off areas of concern, the study utilized a wide range of assessments. The study became complicated and sometimes administratively unwieldly, including the giving and scoring of 314 questionnaires, soliciting subject participation, scheduling 81 subjects for 4-1/2 hours of assessments, scoring those assessments, and transcribing and analyzing the mass of data collected.

However, despite many frustrating moments the methodology did permit a broad-based approach. Now that many bases have been touched, the ones which merit further research seem clearer than before.

Furthermore, the inclusion of students in the study population who were never diagnosed as learning disabled but showed marked learning problems was a departure from usual designs and yielded valuable information. The questionnaire served both to locate subjects with indicators of learning disabilities, as planned, and also brought to the surface 11 students who had been diagnosed as learning disabled, an unanticipated result. None of these 11 students with diagnosed learning disabilities had requested any college assistance due to having a learning disability. However, the existence of these students who had requested no special help leads to further speculation about the incidence of learning disabled students in a selective college population. If 11 of 314 students completing a questionnaire have been diagnosed learning disabled, how many students of a 2000 student undergraduate body have learning disabilities? Furthermore, if a good number of students miss all auditory memory or copying tasks on a questionnaire, and if many, many students indicate that they aren't learning as well or as much as they'd like, the results of the questionnaire may point to a need for further detailed exploration of the interaction of student

learning styles and abilities with the academic demands of a selective college setting.

The scheduling complications, missed appointments, and general unreliability of the LD subjects was quite a contrast to behaviors exhibited by control subjects, who rarely cancelled or missed appointments. The way in which college students with learning disabilities organize themselves to meet the demands of the college curriculum, including scheduling, organization of study time, and just physically getting themselves to the right place at the right time merits further investigation.

A wide range of problem areas and coping strategies were explored. Certain problems were cited again and again: reading difficulties, problems with time, memory difficulties, problems with grammar, detail, and overall organization. Some students were very conscious of techniques used to compensate for deficits; other students did not possess as much insight into their own behaviors. It seems that those LD students with expressive and/or receptive language strengths are most able to compensate for other deficits. Those LD students with verbal conceptualization deficits do less well in college. The more successful LD students seem to realistically accept their situation. They know they are at a disadvantage, and consequently they work harder, are more disciplined and persistent, and generally make more of an effort to keep up with assignments. The less successful LD students often rely upon avoidance tactics and use their problems as an excuse when faced with difficult tasks.

The barriers to learning for LD students are individual to the student. Depending upon the student's own aspirations, different areas of learning may be problematic for LD students. However, the regularity with which problems with time, memory and organization were cited along with the ratings of actual exams and papers indicate that some demands inherent in the college situation may also

constitute barriers for LD students. As more and more students with learning disabilities attend college, colleges will be faced with difficult decisions about alternatives for acceptable academic performance. However, the findings of this exploratory study indicate that learning disabled students attending a selective university are equal to control subjects in conceptual abilities, and that the learning disabled students with good academic performance in college actually possess better ability in verbal conceptualization than control subjects. These findings substantiate the notion that learning disabled college students do possess both learning strengths and compensatory strategies to deal with learning problems. Therefore, the next task facing colleges and universities will be a search for methods which allow learning disabled students to learn and express their learning to the fullest capacity.

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Table 1

Source of Learning Disabled Subjects

	Previously Diagnosed LD (N=25)	Indicators of LD (N=32)
Questionnaire	11	18
Self-Referred	7	10
Faculty Referred	7	4

Table 2

All LD Compared to All control Subjects on Variables of Psychoeducational Assessments*[a]

Variable	LD Mean[b]	SD	Control Mean[b]	SD	F
WAIS-R Overall IQ	109.75	11.53	115.92	10.07	4.831**
WAIS-R Verbal IQ	111.21	11.39	115.88	8.30	2.953*
WAIS-R Perf. IQ	105.07	13.95	111.50	12.80	3.534*
WAIS-R Scatter Score	6.95	1.80	5.88	1.68	6.319**
WAIS-R Bannatyne Spatial	10.51	1.87	11.06	2.26	1.061
WAIS-R Bannatyne Sequencing	10.71	1.43	12.01	1.33	13.736***
WAIS-R Bannatyne Verbal Conc.	11.48	2.98	11.36	2.01	.099
WAIS-R Bannatyne Acq. Know.	10.73	1.61	11.53	.89	4.770**
WAIS-R ACID	10.55	1.28	11.76	1.03	16.002***
Bender Score	.43	.80	.13	.34	-3.100*
TOAL ALQ	112.71	16.56	121.08	12.56	4.462**
WRAT Spelling	103.11	10.11	111.71	8.25	12.412***
WRAT Math	99.11	12.15	111.67	15.02	14.936***
Gates	71.17	12.66	78.62	9.70	5.422**

* $\rho < .10$
** $\rho < .05$
*** $\rho < .005$

[a] One-tailed tests were used in this table and all analysis of variance.

[b] Mean figures given as standard scores with the exception of Gates scores, which are normal curve equivalent scores.

Table 3

All Good Academic Performance LD Students Compared to All Poor Academic Performance LD Students on the Variables of the Psychoeducational Assessments

Variable	Good Academic Performance[a] LD Mean	SD	Poor Academic Performance[a] LD Mean	SD	F
WAIS-R Overall IQ	110.39	11.96	109.10	11.26	.171
WAIS-R Verbal IQ	112.96	11.92	109.46	10.76	1.329
WAIS-R Perf. IQ	104.86	14.57	105.29	13.58	.013
WAIS-R Scatter Score	7.18	1.87	6.71	1.74	.927
WAIS-R Bannatyne Spatial	10.45	2.39	10.56	2.17	.031
WAIS-R Bannatyne Sequencing	10.90	1.44	10.51	1.41	1.058
WAIS-R Bannatyne Verbal Conc.	11.70	2.01	11.26	1.95	.692
WAIS-R Bannatyne Acq. Know.	10.98	1.61	10.48	1.52	1.360
WAIS-R ACID	10.91	1.33	10.19	1.14	4.671**
Bender Score	.39	.83	.46	.79	.108
TOAL ALQ	114.27	17.54	111.31	15.81	.433
WRAT Spelling	105.38	9.50	101.07	10.38	2.566
WRAT Math	100.54	12.14	97.83	12.22	.679
Gates	75.27	11.97	67.34	12.29	5.739**

* $\rho < .10$
** $\rho < .05$

[a] Mean figures given as standard scores with the exception of Gates scores, which are normal curve equivalent scores.

Table 4

All LD Compared to All Control on Ratings of Exam and Paper
(Rating Scale 1 to 5; 1 = excellent performance 5 = poorest performance)

Variable	Mean LD (N=56)	SD	Mean Control (N=24)	SD	F
Exam Neat	3.13	1.04	2.50	1.12	4.849**
Exam Grammatical	3.18	.90	3.05	1.10	.173
Exam Ideas	3.18	1.06	2.40	1.27	5.938**
Exam Spelling	3.24	1.10	2.25	1.03	11.510**
Paper Organization	3.19	1.01	2.63	1.09	3.705*
Paper Neat	2.05	.68	1.79	.86	1.560
Paper Grammatical	3.25	.78	2.47	1.00	10.305**
Paper Ideas	2.89	1.06	2.37	1.16	2.590
Paper Spelling	2.52	1.21	2.32	1.16	.309

* $\rho < .10$
** $\rho < .05$

Table 5

All Good Academic Performance LD Compared to All Poor Academic Performance LD on Ratings of the Exam and Paper
(Rating Scale 1 to 5; 1 = excellent performance, 5 = poor performance)

Variable	Good Academic Performance LD (N=28)		Poor Academic Performance LD (N=28)		F Ratio
	mean	std	mean	std	
Exams Neat	3.35	1.09	2.89	0.96	1.892
Exams Grammatical	3.00	0.79	3.39	0.98	1.824
Exams Ideas	3.15	1.14	3.22	1.00	0.043
Exams Spelling	3.15	1.09	3.33	1.14	0.257
Paper Organization	3.18	1.10	3.19	0.93	0.001
Paper Neat	1.86	0.56	2.24	0.75	3.310*
Paper Grammatical	3.00	0.76	3.50	0.74	4.915**
Paper Ideas	2.68	1.17	3.09	0.92	1.669
Paper Spelling	2.05	1.09	3.00	1.15	7.949**

* $\rho < .10$
** $\rho < .05$

Appendix A

Brief Questionnaire

Name _____ Year at Clark _____ Sex _____

Box Number _____ Major _____

Phone _____

1a. _____

1b. _____

2. Academically, are you doing as well at Clark as you think you could be doing? Yes ____ No ____

3. Are you able to show all you know on exams? Yes ____ No ____

4. Do you feel you learn differently from others? Yes ____ No ____

5. Are you poor in spelling? Yes ____ No ____

6. Do you print when you do written work? Yes ____ No ____

7. Do you have extremely poor handwriting? Yes ____ No ____

8. Do you have difficulty copying figures and designs? Yes ____ No ____

9. Have you ever had a reading problem? Yes ____ No ____

10. Have you ever been diagnosed as having a learning disability? Yes ____ No ____

11. Is your cumulative grade point average above 3.0? Yes ____ No ____

Please copy the following designs:

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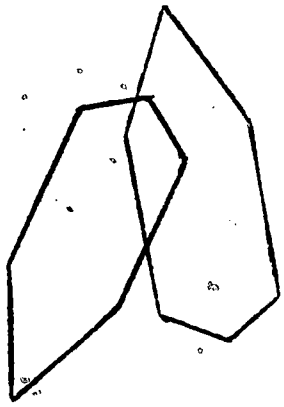

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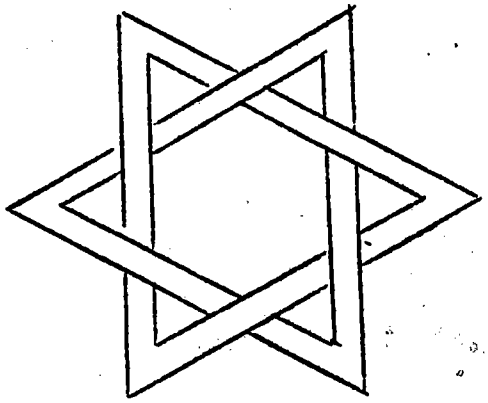

12.

13.

Appendix B

Comparison of LD and Control Subjects on Variables From Interview Data†

	LD (N=56)	Control (N=24)	X^2
Academic Areas Hard, Elem. School			
0-1 Areas	18	22	23.80***
2-4 Areas	38	2	
Help, Elem. School			
0-1 Kinds of Help	35	22	6.96**
2-5 Kinds of Help	21	2	
Academic Areas Hard, High School			
0-1 Areas	12	18	20.57***
2-5 Areas	44	6	
Help, High School			
0-1 Kinds of Help	35	21	5.00**
2-5 Kinds of Help	21	3	
Handedness			
Left	13	1	3.01[a]
Right	43	23	
Mixed Dominance			
Yes	24	5	3.43*
No	32	19	
Wearing Glasses			
Yes	26	16	2.75*
No	30	8	
Physical Problems			
Yes	9	1	1.22[a]
No	47	23	
Reading, Easy, College			
Yes	36	22	6.31**
No	20	2	
Notes, Easy, College			
Yes	42	21	1.56
No	14	3	
Objective Exams, Easy, College			
Yes	40	23	5.97**
No	16	1	

	LD (N=56)	Control (N=24)	X^2
Essay Exams, Easy, College			
Yes	39	22	4.50**
No	17	2	
Papers, Easy, College			
Yes	30	22	10.72**
No	26	2	
Oral Presentations, Easy, College			
Yes	41	21	2.29
No	13	2	
Didn't Know	2	1	
Discussions, Easy, College			
Yes	42	20	<1
No	14	4	
Academic Areas Hard, College			
0-1 Areas	22	22	9.13**
2-5 Areas	34	2	
Help, College			
0-1 Areas	38	18	<1
2-5 Areas	18	6	
Elem., Small Group Learning, Easy			
Yes	48	22	<1
No	5	1	
Don't Know	3	1	
Elem., Shown Material, Easy			
Yes	49	23	1.30
No	7	1	
Don't Know	0	0	
Elem., Told About Material, Easy			
Yes	45	21	<1
No	9	3	
Don't Know	2	0	
H.S. Shown Material, Easy			
Yes	48	22	<1
No	5	1	
Don't Know	3	1	
H.S., Told About Material, Easy			
Yes	50	23	<1
No	4	1	
Don't Know	2	0	

	LD (N=56)	Control (N=24)	X^2
Elem., Oral Expression Easy			
Yes	44	19	<1
No	12	5	
Don't Know	0	0	
Elem., Written Expression Easy			
Yes	33	24	13.88
No	23	0	
Don't Know	0	0	
Elem., Pictoral Expression Easy			
Yes	37	21	3.50
No	18	3	
Don't Know	1	0	
Elem., During school day, by school personnel			
Yes	24	3	6.93*
No	32	21	
Elem., After school, by school personnel			
Yes	6	1	<1
No	50	23	
Elem., Private tutors			
Yes	12	0	4.48*
No	44	24	
Elem., Family Help			
Yes	26	5	4.60*
No	30	19	
Elem., Help by Friends			
Yes	3	1	<1
No	53	22	
H.S., During school day, by school personnel			
Yes	19	2	5.68*
No	37	22	
H.S., After school, by school personnel			
Yes	11	4	<1
No	45	20	
H.S., Private tutors			
Yes	14	4	<1
No	42	20	

	LD (N=56)	Control (N=24)	X^2
H.S., Family Help			
Yes	12	4	<1
No	44	20	
H.S., Help by Friends			
Yes	4	1	<1
No	52	23	
Coll., Friends			
Yes	17	9	<1
No	39	15	
Coll., Faculty			
Yes	21	8	<1
No	35	16	
Coll., University Resources			
Yes	19	3	3.86 **
No	37	21	
Coll., Private Tutor			
Yes	2	0	<1
No	54	24	
Coll., Family			
Yes	4	1	<1
No	52	23	

* $\rho < .10$
** $\rho < .05$
*** $\rho < .005$

[a] Yates correction used

† Two-tailed tests were used here and in all chi-square analysis.

Comparison of Good and Poor Academic Performance LD Subjects on Variables From Interview Data

	Good Academic Performance LD (N=28)	Poor Academic Performance LD (N=28)	X^2
Academic Areas Hard, Elem. School			
0-1 Areas	10	8	<1
2-4 Areas	18	20	
Help, Elem. School			
0-1 Kinds of Help	17	18	<1
2-5 Kinds of Help	11	20	
Academic Areas Hard, High School			
0-1 Areas	7	5	<1
2-5 Areas	21	23	
Help, High School			
0-1 Kinds of Help	18	17	<1
2-5 Kinds of Help	10	11	
Handedness			
Left	6	7	<1
Right	22	21	
Mixed Dominance			
Yes	10	14	1.16
No	18	14	
Wearing Glasses			
Yes	14	12	<1
No	14	16	
Physical Problems			
Yes	6	3	1.20
No	22	25	
Reading, Easy, College			
Yes	18	18	<1
No	10	10	
Notes, Easy, College			
Yes	24	18	3.43
No	4	10	
Objective Exams, Easy, College			
Yes	22	18	1.40
No	6	10	
Essay Exams, Easy, College			
Yes	21	18	.76
No	7	10	

	Good Academic Performance LD (N=28)	Poor Academic Performance LD (N=28)	X^2
Papers, Easy, College			
Yes	20	10	7.18**
No	8	18	
Oral Presentations, Easy, College			
Yes	20	21	.74
No	6	7	
Discussions, Easy, College			
Yes	21	21	.58
No	7	7	
Didn't Know	2	0	
Academic Areas Hard, College			
0-1 Areas	15	7	4.78**
2-5 Areas	13	21	
Help, College			
0-1 Areas	20	18	.32
2-5 Areas	8	10	
Elem., Small Group Learning, Easy			
Yes	22	26	<1
No	3	2	
Don't know	3	0	
Elem., Shown Material, Easy			
Yes	24	25	<1
No	4	3	
Don't know	0	0	
Elem., Told About Material, Easy			
Yes	22	23	<1
No	5	4	
Don't know	1	1	
H.S. Shown Material, Easy			
Yes	24	24	<1
No	2	3	
Don't know	2	1	
H.S., Told About Material, Easy			
Yes	26	24	<1
No	1	3	
Don't know	1	1	
Elem., Oral Expression Easy			
Yes	22	22	<1
No	6	6	
Don't know	0	0	

College LD
36.

	Good Academic Performance LD (N=28)	Poor Academic Performance LD (N=28)	X^2
Elem., Written Expression Easy			
Yes	18	15	<1
No	10	13	
Don't know	0	0	
Elem., Pictoral Expression Easy			
Yes	19	18	<1
No	9	9	
Don't know	0	1	
Elem., During school day, by school personnel			
Yes	11	13	<1
No	17	15	
Elem., After school, by school personnel			
Yes	1	4	<1
No	27	24	
Elem., Private tutors			
Yes	8	4	1.70
No	20	24	
Elem., Family help			
Yes	14	12	<1
No	14	16	
Elem., Help by friends			
Yes	2	1	<1
No	26	27	
H.S., During school day, by school personnel			
Yes	9	10	<1
No	19	18	
H.S., After school, by school personnel			
Yes	5	6	<1
No	23	22	
H.S., Private tutors			
Yes	8	6	<1
No	20	22	
H.S., Family help			
Yes	7	5	<1
No	21	23	

	Good Academic Performance LD (N=28)	Poor Academic Performance LD (N=28)	X^2
H.S., Help by friends			
Yes	1	3	<1
No	27	25	
Coll., Friends			
Yes	8	9	<1
No	20	19	
Coll., Faculty			
Yes	10	10	<1
No	18	18	
Coll., University Resources			
Yes	7	11	<1
No	21	17	
Coll., Private Tutor			
Yes	1	1	<1
No	27	27	
Coll., Family			
Yes	3	1	<1
No	25	27	

* $\rho < .10$
** $\rho < .05$
*** $\rho < .005$